

REMARKS

Claims 1 and 4-21 are pending in this application. Claims 11-20 are withdrawn. By this Amendment, claims 1 and 18 are amended to incorporate the subject matter of claim 3. These amendments are supported at least by page 7, lines 21-24 of the original specification. Claim 3 is canceled. No new matter is added by this Amendment.

I. Response To Restriction Requirement

In reply to the Restriction Requirement, Applicants provisionally elect Group I, with traverse. At least claims 1, 3-13 and 21 read on the elected invention.

PCT Rule 13.1 provides that an "international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept." PCT Rule 13.2 states:

Where a group of inventions is claimed in one and the same international application, the requirement of unity of invention referred to in Rule 13.1 shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.

The Office Action asserts that the special technical feature common to the claims is a "catalyst system which is obtainable from at least one bismuth compound and at least one aromatic nitrogen compound." Applicants respectfully disagree.

An examination of all the claims would indicate that the catalyst for polyurethane compositions as set forth in claim 18 is common to all the claims. Although original claim 1 is not limited to the catalysts set forth in claim 18, claim 1 is generic and encompasses the catalysts of claim 18. As such, the "technical relationship" between claim 1 and claim 18, or between all the claims, is more than a "catalyst system which is obtainable from at least one

bismuth compound and at least one aromatic nitrogen compound;" instead, it is at least the catalyst system set forth in original claims 2 and 18.

Accordingly, Applicants respectfully submit that there is nothing of record that establishes that the catalyst system defined by amended claim 1 fails to define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art. As such, reconsideration and withdrawal of the restriction requirement is respectfully requested.

II. Objections To The Abstract

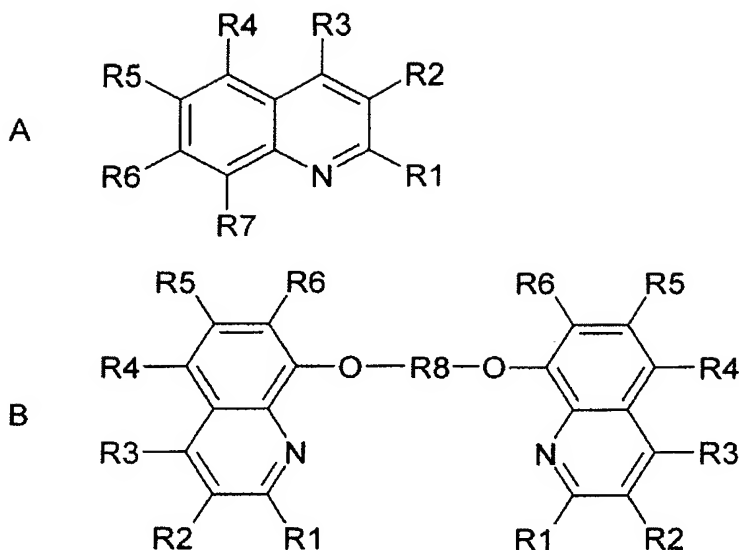
The Patent Office requested revision of the Abstract. Applicants have thus amended the Abstract accordingly.

III. Rejections Under 35 U.S.C. §103(a)

A. Dammann

Claims 1 and 3-13 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 4,788,083 ("Dammann"). Applicants respectfully traverse this rejection.

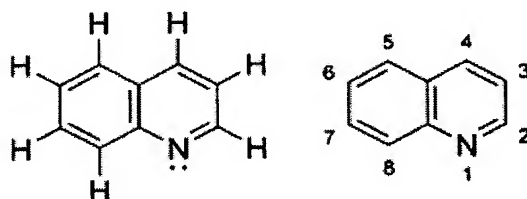
As amended, claim 1 recites a one-component polyurethane composition comprising: at least one polyurethane prepolymer having terminal isocyanate groups, prepared from at least one polyisocyanate with at least one polyol; and at least one catalyst system obtained from at least one bismuth compound and at least one aromatic nitrogen compound, wherein the aromatic nitrogen compound has the formula A or B,



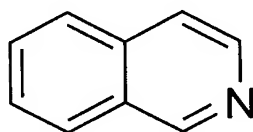
where: R1, R2, R3, R4, R5 and R6 each independently of one another is H, methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, tert-butyl, C₅ to C₁₂ alkyl, COOH, COOR' or halogen, R7 is a C₁ to C₈ alkyl, a hydroxyl group (OH), O-(CH₂CH₂O)_x-R' with the values for x of 1-6, or O-(CH₂CH(CH₃)O)_x-R' or a positional isomer thereof, with the values for x of 1-6, R8 is alkylene or alkylene ether, R' is alkyl, and R'' is alkyl or alkyl with heteroatoms. In other words, claim 1 defines that the R7 substituent in the aromatic nitrogen compound of formula A is (1) a C₁ to C₈ alkyl, (2) OH, (3) O-(CH₂CH₂O)_x-R', or (4) O-(CH₂CH(CH₃)O)_x-R' or a positional isomer thereof, wherein x is a value of 1-6, R' is alkyl, and R'' is alkyl or alkyl with heteroatoms.

However, Dammann describes a polyurethane coating and primer composition prepared from a catalyzed reaction mixture comprised of (1) a hydroxyl containing compound, (2) an isocyanate or polyisocyanate, and (3) a complex catalyst formed from the combination of a bismuth or tin catalyst, a complexing agent, such as a mercaptan, in the presence of tertiary amine. See Dammann, the Abstract, col. 11, lines 45-65, col. 2, lines 50-58.

Furthermore, Dammann describes that the amine activator may be quinoline or its structural isomer isoquinoline (as illustrated by the following chemical compounds).



Chemical Structure Of Quinoline



Chemical Structure Of Isoquinoline

If the aromatic nitrogen compound of formula A was unsubstituted (i.e., the R1-R7 substituents are hydrogen atoms), a quinoline compound would result. However, Applicants have amended claim 1 (and claim 18) to recite that the R7 substituent for formula A is a C₁ to C₈ alkyl, a hydroxyl group (OH), O-(CH₂CH₂O)_x-R' with the values for x of 1-6, or O-(CH₂CH(CH₃)O)_x-R' or a positional isomer thereof, with the values for x of 1-6.

As such, Dammann would not have provided one of ordinary skill in the art with any reason or rationale to have formed a one compound polyurethane composition from the catalyst system recited in claim 1 with any reasonable expectation of success.

Withdrawal of the rejection is requested.

B. Dammann In View Of Jayawant

Claim 21 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Dammann in view of U.S. Patent No. 3,635,906 ("Jayawant"). Applicants respectfully traverse the rejection.

The Patent Office admits that Dammann does not describe an aromatic nitrogen compound having the chemical structure of formula A, wherein the R7 substituent is a hydroxyl group (OH) and thus introduces Jayawant as allegedly describing this feature.

Specifically, the Patent Office alleges that Jayawant describes a method of preparing polyurethanes using a tin catalyst in combination with a beta-hydroxy nitrogen-heterocyclic fused aromatic compound such 8-hydroxyquinoline. See Office Action, page 6 (citing Jayawant, the Abstract and col. 7, line 65). Applicants respectfully disagree for the reasons discussed below.

Jayawant does not describe the use of a bismuth catalyst with a fused aromatic compound. Instead, Jayawant describes a tin catalyst that extends the pot life of the reaction medium without retarding the rate of cure. See Jayawant, col. 1, lines 67-72 and col. 8, lines 24-28. Furthermore, neither Jayawant nor Dammann describe the increase level of toxicity involved with using a tin catalyst system or the problems associated with storage stability. See page 1, line 37 to page 2, line 6 of the present specification.

As such, Applicants submit that one having ordinary skill in the art, when reviewing both Dammann and Jayawant, would not have combined the 8-hydroxyquinoline of Jayawant with the bismuth described in Dammann because Jayawant is directed solely to the combination of a tin catalyst with 8-hydroxyquinoline.

Furthermore, Dammann or Jayawant do not describe the unexpected results regarding a low increase in viscosity (which translates to a good storage stability) and a fast cure (skin formation time) obtained from a one-component polyurethane composition comprised of a catalyst system that includes bismuth compound and an aromatic nitrogen compound of formula A, wherein the aromatic nitrogen compound has an hydroxyl group (OH) as the R7 substituent of Formula A, as recited in claims 1 and 21. These unexpected results are summarized in the present specification.

In particular, Table 1 of the specification summarizes a comparison between two different bismuth-catalyzed polyurethane compositions stabilized with various compounds L. See page 18 of the specification. Compound L, for example, was designated as 8-hydroxyquinoline (Example 7) and quinoline (Example 9). As such, Example 7 is representative of the embodiment described in claims 1 and 21 of the present application. However, Example 9 (a comparative example) is representative of the embodiment described in Dammann.

Example 7 was prepared by charging a glass flask with bismuth tris(neodecanoate) in neodecanoic acid and 8-hydroxyquinoline (mole ratio 6:1; bismuth content 20 weight percent) and diluting the mixture diisodecyl phthalate to a total bismuth content of 2.0 weight percent. See page 16, lines 3-10 of the specification. The mixture was then placed under a dry nitrogen purge and heated to 100°C for one hour and mixed into a isocyanate-terminated polyurethane prepolymer. See page 16, lines 10-18. The composition of the isocyanate-terminated prepolymer is described at page 16, lines 19-26 of the specification. After mixing with the isocyanate-terminated prepolymer, the resulting composition was immediately introduced into internally coated aluminum tubes and stored in an oven at a temperature of 60°C. See page 16, lines 27-30 of the specification.

Example 9 was prepared in the exact same manner as Example 7, except that 8-hydroxyquinoline was replaced with quinoline. See paragraphs [0051]-[0054] and [0056] of the specification.

The skin formation time and increase in viscosity were measured for Example 7 and Example 9. The details for determining the skin formation time are summarized at page 16, line 34 to page 17, line 2 of the original specification. The details for the increase in viscosity are summarized at page 17, lines 3-8 of the original specification. These results are summarized below in Table 1 (and Table 1 of the original specification).

Table 1: Skin Formation Time and Increase In Viscosity Results For Example 7 and Example 9

	Compound L	Skin Formation Time (min)	Increase In Viscosity (%)
Example 7	8-hydroxyquinoline	84	16
Example 9	quinoline	85	95

As seen from above, while the skin formation time remained relatively similar, a bismuth-catalyzed polyurethane composition stabilized with 8-hydroxyquinoline instead of quinoline resulted in an unexpected and much lower increase in viscosity.

Thus, Dammann and Jayawant do not describe the unexpected benefit of a much lower increase in viscosity for a bismuth-catalyzed polyurethane composition stabilized with 8-hydroxyquinoline. Dependent claim 21 would not have been obvious from Dammann and Jayawant for at least the above reasons.

Withdrawal of the rejection is requested.

C. Conclusion

In view of the foregoing amendments and arguments, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejections.

IV. Rejoinder

In view of the foregoing amendments and arguments, Applicants respectfully request that upon allowance of claims 1, 4-10 and 21, claims 11-20 be rejoined with the present application and similarly allowed.

V. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1 and 4-21 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Date: August 24, 2009

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